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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/033,222	03/02/1998	TADD H. HOGG	D/98093	1837

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EXAMINER	
SHAPIRO, JEFFERY A	
ART UNIT	**PAPER NUMBER**
3653	

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Please find below and/or attached an Office communication concerning this application or proceeding.

SK

Office Action Summary	Application No.	Applicant(s)
	09/033,222	HOGG ET AL.
	Examiner	Art Unit
	Jeffrey A. Shapiro	3653

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 08 March 2002.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-20 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-20 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

2. Claims 1-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujita et al (IEEE publication by Satoshi Konishi and Hiroyuki Fujita, entitled *"A conveyance System Using Air Flow Based on the Concept of Distributed Micro Motion Systems"*, June 1994, IEEE, Journal of Microelectromechanical Systems, Vol. 3., No.2.) in view of Harada et al. Fujita et al discloses the transport assembly as follows.

As described in Claims 1, 7, 8 and 15;

1. sensor units and actuator units arranged on the transport assembly;
2. said sensor units for providing positional information of the object;
3. said actuator units (see "logic circuit" in figure 1) for moving the object relative to the transport assembly (see figure 2);
4. *each computational agent receiving positional information from at least one sensor unit and computing a desired actuator response for at least one actuator unit in a spatially localized region of control on the transport assembly;* (Note that the apparatus of Fujita et al is a transport system made up of an array of distributed micro motion systems. As such, it is, at the very least, inherently necessary for positional information from said sensors to be passed through said communication circuit.)

5. *wherein said computational agents are grouped into a plurality of local neighborhoods;* (See figure 1, noting that each module having an actuator, sensor, logic circuit and communication circuit may be construed as a local neighborhood, and that it is inherent that in order for such a micro motion system to work, small groups of these local neighborhoods would have to be coordinated.)

6. *the computational agents in each local neighborhood being:*

   a. *coupled to sensors and actuators that are located physically proximate to each other on the transport assembly* (see figure 1)*;*

   b. *communicatively coupled to each other for directly communicating their desired actuator responses to each other* (see figure 1)*;*

7. *each of said computational agents use;*

   i. *the global constraints delivered by the global controller (note that position is considered to be a global constraint);*

   ii. *the desired actuator responses received from the computational agents in their local neighborhood (note that a logic circuit is included in each module, which may be construed to be capable of computing);*

iii. the positional information from the at least one sensor unit in its spatially localized region of control (again, note that a sensor is located in each module for sensing position);

to determine adjustments to the at least one actuator unit in its spatially localized region of control to move the object along the transport assembly;

(Note that on p.54, under "Introduction", lines 12-17, Fujita et al states that coordination of many microactuators by allotting a portion of a complex task to each microactuator is the intended method of control of a distributed micro motion system. This scheme inherently requires the previously mentioned information to be used.)

As described in Claim 8;

8. said actuator units are spatially proximate to each other and ones of said sensor units (see figure 1 of Fujita et al);

Fujita et al notes in the Abstract, at lines 3-7, that distributed coordination and control of said individual sensor units and actuator units is desired. Fujita et al notes under *Introduction*, first paragraph, that coordination of multiple "smart modules", each having at least an actuator, a sensor and logic circuit.

Fujita et al does not expressly disclose the following.

As described in Claims 2 and 20;

9. a lookup table for communicating the global constraints to said computational agents;

As described in Claim 3;

10. a filter unit for computing the aggregate operating characteristics after receiving the positional information from the local computational units;

As described in Claim 4;

11. said global controller receives the aggregate operating characteristics over a first operating interval;

As described in Claim 5;

12. said global controller delivers the global constraints over a second operating interval;

As described in Claim 6;

13. the second operating interval is longer than the first operating interval;

As described in Claim 9;

14. said computational agents compute a global response using the global constraints;

As described in Claim 10;

15. *each* computational agent computes *the desired actuator* response *using* the *positional* information *from the at least one sensor unit in its spatially localized region of control on the transport assembly*;

As described in Claim 11;

16. said computational agents determine *whether spacially localized groupings of sensor and actuator units function properly*;

As described in Claim 12;

17. said computational agents rank the global response and the *desired actuator* response in importance using weights;

As described in Claim 13;

18. said computational agents adaptively determine values for the weights;

As described in Claim 14;

19. said local computational agents and said global controller are organized hierarchically;

As described in Method Claim 16;

20. *wherein the computed actuator response* compensates for malfunctioning actuators;

As described in Method Claim 17;

21. *the desired actuator response is computed using accumulated positional information from the at least one sensor in its spatially localized region of control on the transport assembly* ;

As described in Method Claim 18;

22. *wherein the size of the local neighborhoods of computational agents is determined adaptively* ;

As described in Method Claim 19;

23. determining whether spatially localized groupings of sensor and actuator units function properly;

Harada et al discloses the following.

As described in Claims 2 and 20;

9. a lookup table for communicating the global constraints to said computational agents (see figures 6-8);

As described in Claim 3;

10. a filter unit (42, 43 or 48) for computing the aggregate operating characteristics after receiving the positional information from the local computational units (note figure 1, indicating that several subsystems may be linked to higher supervisory systems indicating in turn that the calculating subsystem (48), for example, could be repeated on each level in a similar fashion to the lowest level subsystem—note also figure (23) which has element (23) for evaluating subgoal achievement performances as well as information interpreting subsystem (41) which could both be construed to contain algorithms for computing aggregate operating characteristics);

As described in Claim 4;

11. said global controller (1) receives the aggregate operating characteristics over a first operating interval (note that it is a matter of design choice as to how many operating intervals are sampled);

As described in Claim 5;

12. said global controller (24) delivers the global constraints over a second operating interval (note that this is a matter of design choice as to when to deliver the global constraint to the subsystem);

As described in Claim 6;

13. the second operating interval is longer than the first operating interval (note that the operating intervals are a function of design choice and would be adjusted to be able to accommodate the specific case);

As described in Claim 9;

14. said computational agents compute a global response using the global constraints (see figure 2 noting (45));

As described in Claim 10;

15. *each* computational agent computes *the desired actuator* response *using* the *positional* information *from the at least one sensor unit in its spatially localized region of control on the transport assembly* (see figure 2 noting (50));

As described in Claim 11;

16. said computational agents determine *whether spacially localized groupings of sensor and actuator units function properly* (see figures 1-3, noting that localized knowledge is able to be used to determine if individual actuator units are functional);

As described in Claim 12;

17. said computational agents rank the global response and the *desired actuator* response in importance using weights (see claim 5, col. 11, lines 33-36 and col. 12, lines 1-5 noting that costs are essentially weights);

As described in Claim 13;

18. said computational agents adaptively determine values for the weights (note that the system is, at the very least, inherently adaptive based upon local responses and knowledge—see col. 1, lines 56-60);

As described in Claim 14;

19. said local computational agents and said global controller are organized hierarchically (see figure 1);

As described in Method Claim 16;

20. *wherein the computed actuator response* compensates for malfunctioning actuators; (Note that it is inherent that the adaptive control system of Harada et al is able to compensate for malfunctioning or missing actuators.)

As described in Method Claim 17;

21. *the desired actuator response is computed using accumulated positional information from the at least one sensor in its spatially localized region of control on the transport assembly* (see figures 1-3);

As described in Method Claim 18;

22. *wherein the size of the local neighborhoods of computational agents is determined adaptively* (see figures 1-3);

As described in Method Claim 19;

23. determining whether spatially localized groupings of sensor and actuator units function properly (again, note that it is inherent that the adaptive control system of Harada et al is able to detect groups of sensors and actuators and determine their functional capabilities based on their output—see also figures 1-3 and col. 9, lines 51-63);

Both Fujita et al and Harada et al are analogous art because they concern distributed control and the solving of associated problems such as coordination of disparate subsystems. (See abstracts of Fujita et al and Harada et al. Note also Fujita, introduction, lines 9-19)

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to have used the distributive control system of Harada et al to control the microactuator arrays of Fujita et al.

The suggestion/motivation for doing so would have been to distributively control the microactuator arrays of Fujita. (See abstract of Fujita et al.)

Therefore, it would have been obvious to combine Fujita et al with Harada et al to obtain the invention as specified in Claims 1-20.

Double Patenting

3. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington,* 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

4. Claim 1-20s are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over Claims 1-20 of U.S. Patent No. 6,119,052. Although the conflicting claims are not identical, they are not patentably distinct from each other because they both describe a distributed control system for controlling microactuator arrays to transport sheets.

Claim 1-20s are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over Claims 1-20 of U.S. Patent No. 6,039,316. Although the conflicting claims are not identical, they are not patentably distinct from each other because they both describe a distributed control system for controlling microactuator arrays to transport sheets.

Claims 1-20 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over Claims 1-20 of U.S. Patent No. 6,027,112. Although the conflicting claims are not identical, they are not patentably distinct from each other because they both describe a distributed control system for controlling microactuator arrays to transport sheets.

Claims 1-20 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over Claims 1-6 of U.S. Patent No. 5,634,636 in view of Fujita et al, described above. Although the conflicting claims are not identical, they are not patentably distinct from each other because they both describe a distributed control system for controlling microactuator arrays to transport sheets.

Claims 1-20 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over Claims 1-6 of U.S. Patent No. 5,634,636 in view of Harada et al, described above. Although the conflicting claims are not identical, they are not patentably distinct from each other because they both describe a distributed control system for controlling microactuator arrays to transport sheets.

Response to Arguments

5. Applicant's arguments filed 3/8/02 have been fully considered but they are not persuasive. In addition to the above discussion, note that on p.54 of Fujita et al, 2nd col., first five lines, that the distributed micro motion system of Fujita is described as an X-Y positioner. Such a positioner may be construed as an *obvious alternative* to a

"lookup table" as described, for example, in Applicant's Claim 2, since such an X-Y grid or positioner has X-Y coordinates which may be accessed and used as global or local constraints.

Conclusion

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeffrey A. Shapiro whose telephone number is (703)308-3423. The examiner can normally be reached on Monday-Friday, 9:00 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Donald P. Walsh can be reached on (703)-306-4173. The fax phone numbers for the organization where this application or proceeding is assigned are (703)-

308-2571 for regular communications and (703)-308-2571 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-1113.

DONALD P. WALSH
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 3600

Jeffrey A. Shapiro
Patent Examiner,
Art Unit 3653

May 16, 2002